

## **REMARKS**

The claims pending in the application are claims 1-23. The claims currently under consideration are claims 1-9, 19, and 20-23. In the office action, Applicant amended claims 1, 19, and 20 and added new claims 21-23. Support for the amendment to claims 1, 19 and 21 may be located on page 4, lines 10-12 of the application. Support for the new 21 claim may be found page 4, lines 2-6 of the application. The phosphate anion is the phosphorous anion of the various compounds listed in the passage. Support for new claim 22 may be found in claims 1 and 6 of the application as filed. Support for claim 23 may be found on page 1, lines 7-8. No new matter has been added to the application as part of the amendment. Reconsideration of the application as amended is requested along with a notice of allowance of the pending claims.

## **The Office Action**

### **Election/ Restriction**

In the action, the Examiner issued the following restriction requirement under 35 U.S.C. § 121: (I) Claims 1-9, 19, and 20 drawn to a coating composition and (II) Claims 10-18, drawn to a coating process. The Examiner based the restriction on a belief that the process for using the composition can be practiced with another materially different composition such as a chromium free conversion coating composition. The Examiner concluded that the process for using the composition as claimed can be practiced with another materially different composition.

Applicant hereby affirms with traverse the election of Group I of the claims. Applicant respectfully traverses the restriction requirement on the grounds that many of the elements which the Examiner will be searching for in Group II are the same as the elements which the Examiner has located with the search regarding Group I. Both the composition and the coating process are drawn to forming a black trivalent chromium composition on zinc or a zinc alloy. Both sets of claims include the element of the pH of the aqueous acidic solution, claim 10 and claim 9. Also both sets of claims include the element of the trivalent chromium ions in a concentration of about 0.02 M to about 0.2M. Also each group of claims includes the elements of the phosphorous anions, the selected anions, the transition metal or metalloid, and the organic chelating agent. Given the fact

that some many of the elements are included in each grouping of claims, Applicant respectfully disagrees that searching both groupings of claims is an undue burden on the Examiner. Applicant respectfully requests that the restriction requirement is withdrawn.

### **35 U.S.C. § 103 Rejection**

The Examiner rejected claims 1-9 and 19-20 under 35 U.S.C. § 103(a) as being unpatentable over WO 02/07902 (WO '902) in view of Huvar, U.S. Patent No. 4,349,392 (Huvar). According to the Examiner WO '902 teaches an anticorrosive aqueous acidic coating comprising 0.02 to 0.58 M of Cr(III), 0.1 to 0.42 M of phosphate ions, 0.001 to 0.1 M of iron, cobalt, and/or nickel ions. The Examiner also stated that WO '902 also teaches that the coating comprises one or more citric acid, tartaric acid, malonic acid as complexing agents.

The Examiner opined that the one or more of citric acid, tartaric acid, and malonic acid read on the claimed chelate; that nitrate and sulfate ions from the nitric or sulfuric acid used for pH control read on the claimed sulfate and/or nitrate ions; the iron, cobalt, and nickel ions read on the claimed transition metal or metalloid; that the claimed concentrations of Cr (III) ions, phosphorous anions, Fe/Co/Ni ions, chelate and the pH value ranges overlap with the claimed concentration ranges and the claimed pH value.

The Examiner did state that WO '902 does not teach the claimed chelate concentration ranges as recited in claims 7 and 19. On this point, the Examiner concluded that Huvar teaches a Cr(III) acidic solution with Cr(III) ions, iron/cobalt/nickel ions, nitrate and sulfate ions and carboxylic acid of the concentration of 0.05 to 4.0 g/l. According to the Examiner it would have been obvious to incorporate the carboxylic acid of Huvar into the teachings of WO '902 in order to increase the clarity and initial hardness of the chromate film as taught by Huvar.

Applicant respectfully states that the claims are patentable over the combination of references as cited by the Examiner. The references do not teach that the claimed concentration of the nitrate ions and/or the sulfate ions. Furthermore the references do not suggest the claimed concentration of the nitrate ions and/or the sulfate ions. In the claimed concentration of the nitrate ions and/or the sulfate ions, the ions are present in an amount sufficient for the ions to participate in film formation.

As cited by the Examiner, the reference only teaches that the ions are present to control the pH of the solution. Additionally, in reviewing the cited amounts of nitric acid in the reference, the concentration is less than the claimed amount. For instance, example 3 includes 0.9 g/L of nitric acid which equates to a concentration of 0.014 M. In example 5, the amount of nitric acid is even less, 0.6 grams in one liter of solution.

It is advantageous to form a consistent thickness and uniform film. It is preferred that a sufficient amount of nitrate and/or sulfate ions are present to form the film with appropriate thickness and uniformity. If not enough of the ions are present the film most likely will not form and if the concentration of the ions is too high, patches of the film will form and the film will not uniformly cover the part to be coated. As such, if a part is coated within an inadequate coating, it is unlikely that a uniform black coating will be able to be formed on the zinc coated part.

Another advantage of the claimed invention is that it may be used to form a black coating on a zinc coated substrate. The reference cited by the Examiner does not address applying the black coating to a non-alloy zinc coated substrate. Given the lack of other materials in the zinc coating, it is much more difficult to apply a conversion coating to a zinc coating than to a zinc alloy coating. The zinc alloy will include other materials which are beneficial to the conversion coating process, which will inhibit the precipitation of the chrome. In the case of conversion coating a zinc coating, other steps must be taken to inhibit the formation of the chrome precipitation.

The claimed subject also has exhibited other beneficial attributes over the teachings of the WO '902 reference. For example, WO '902 teaches the use of hypophosphite and the criticality of using the phosphite. WO '902 specifically teaches that the hypophosphite must be present for the reference solution to be used for forming a conversion coating if the solution has a pH of 3.0 or more.

In contrast, the claimed subject matter may be used to form a black conversion coating on a zinc coated part with a pH of 3.0 or greater. As shown in the examples of the application, the claimed subject matter does not need to include the hypophosphite of the reference. As disclosed in the application a preferred pH range of the claimed subject matter is up to 3.5. Therefore, it is inherent that the claimed subject matter has a greater resistance to the formation chrome precipitation for at least the reason that it may be used

at a pH of 3.0 to 3.5 to apply the black conversion coating without the hypophosphite component of WO '902.

Furthermore, WO '902 teaches silicon dioxide should be included for corrosion protection. As for the claimed subject matter, the inventors have not observed a need to include a corrosion inhibitor such as silicon dioxide. Thus, the claimed subject has superior corrosion resistance capabilities than those of the reference. This is also true for the combination of Oshima et al. and WO '902.

Lastly, the combination of references as cited by the Examiner lacks the necessary motivation to combine the references. The Examiner combines the WO '902 reference and the Huvar reference based on a desire of a person of ordinary skill in the art to improve the clarity/ initial hardness.

With respect to forming a black conversion coating on a zinc coating, the clarity of the coating is not an issue. Also faced with the issue of forming a black conversion coating, a person of ordinary skill in the art would not review a reference regarding a conversion coating which may range from clear to blue-bright, with a focus on films having a yellow to light blue appearance through the use of cerium. A person of ordinary skill in the art would quickly recognize Huvar as a reference based on the use cerium and would know that such a compound is used to produce a yellow coating on zinc could not be used to achieve the desired black coating.

Huvar also teaches the use hydrogen peroxide as an oxidizing agent. A person of ordinary skill in the art would know that such a reference is inappropriate for a solution which is to be used to apply a black coating to a zinc coated part. In the claimed subject matter, a person of ordinary skill in the art would not want to use the hydrogen peroxide oxidizing agent for the reason that such a compound would react with the metal or metalloids included in the claimed solution and cause the metals or metalloids to precipitate out of the solution. With the metals precipitated out of the solution, the claimed solution would not be able to achieve the desired black coating.

Also the Oshima et al. reference discloses another reason why a person of ordinary skill in the art would not be interested in reviewing the Huvar reference. The claimed subject matter is directed at making a chromium coating which is free of hexavalent chromium. Oshima teaches that in cases of a conversion coating which uses an oxidizing

agent, cerium, and trivalent chromium, that in the bath or during storage, the trivalent chromium may be oxidized into hexavalent chromium. See column 1, lines 40-49 of Oshima et al. For these reasons, the presence of hexavalent chromium ions is directly opposite to one of the advantages of the claimed subject matter. A person of ordinary skill in the art would not use the teachings of such a reference to make a conversion coating devoid of such ions.

In view of the above, Applicant states that a person of ordinary skill in the art would not combine the references as claimed by the Examiner in hindsight. In making the combination, the Examiner is impermissibly ignoring those portions of the Huvar reference which would lead a person of ordinary skill in the art away from forming a solution that may be used to form the claimed solution. As such the Examiner is using impermissible hindsight to make the combinations of references, by choosing those portions of the references which may assist with forming the claimed subject, however, the Examiner is ignoring disclosure that teaches away from the claimed subject matter as indicated above, For all of the above reasons, the Applicant requests that the rejection of the claims based on the above combination of the references is withdrawn.

The Examiner also rejected claims 1-9 and 19-20 under 35 U.S.C. 103(a) as being unpatentable over Oshima et al. U.S. 6,719,852 (Oshima) in view of WO '902. The Examiner alleged that Oshima teaches the oxalic acid or any of the carboxylic acids listed ... read on the claimed chelate, the nitrate and sulfate ions of the inorganic salts of the nitric and sulfuric acid ... read on the claimed sulfate and/or nitrate ions, and the cobalt ions as taught by Oshima read on the claimed transition metal or metalloid.

The Examiner indicated that Oshima does not explicitly teach the coating solution can produce a black coating as claimed in the instant application. The Examiner looks to WO '902 for the teachings regarding how to make a black coating. According to the Examiner on page 2 at lines 4-6, WO '902 teaches that the composition having a concentration of 0.001 M to 0.1 M of cobalt will produce a black finish or that black pigment may be added to the composition to achieve a black finish. The Examiner concluded that it would have been obvious to one of ordinary skill in the art to include the afore teachings of WO '902 into Oshima to produce a black chromate coating.

Applicants submit that the Examiner is making numerous assumptions and unsupported conclusions in rejecting the present claims over Oshima in view of WO '902. For example, the Examiner acknowledges that Oshima fails to teach a black coating. The Examiner looks to WO'902 to find a teaching of cobalt inclusion to produce a black finish. However, Oshima at column 4, lines 33-45 teach cobalt inclusion to increase the corrosion resistance of the resultant conversion film. Why would adding cobalt from the WO '902 disclosure into Oshima (which already includes cobalt) result in a black coating when one was not present before? Applicants note that this result may occur because of the many and various significant differences between the presently claimed invention and the Oshima teaching. Moreover, Oshima requires oxalic acid. Oshima requires a silicon compound. Oshima does not teach a chelate, but rather one is inferred by the Examiner. Oshima does not teach the claimed ranges of sulfite ions or nitrate ions. In short, Oshima differs significantly from the claimed invention. The teachings relied on in WO '902 are being relied upon based solely on the hindsight provided by the present invention. Moreover, there is no desire in Oshima to produce a black coating. Accordingly, the Examiner appears to be completely revamping the Oshima corrosion conversion film in an effort to overlap the presently claimed invention. Applicants submit that such an undertaking is based on hindsight and does not render the presently claimed invention obvious.


### CONCLUSION


For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-9, 19, and 20) are now in condition for allowance.

Respectfully submitted,

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